STYLUS REMOVAL MECHANISM

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to a stylus removal mechanism for use in removing a stylus from portable computing devices.

2. Background Art

Portable computing devices, such as palm-top computers, hand-held computers, laptop computers and personal digital assistants (PDAs), have become increasingly popular. Many of these portable computing devices include an electronic stylus or pen that can be utilized by a user to input information into the computer or to select menu options or otherwise navigate through the graphical user interfaces of an operating system or the current software application.

Currently, the stylus is either clipped to the outer housing of the portable computing device, or stored inside the housing of the portable computing device. Clipping the stylus to the outside of the housing provides convenient access to the stylus, but also carries the disadvantage that the stylus can be easily dislodged from the clip by inadvertent contact with objects, such as the inner surfaces of a carrying case or other objects in the carrying case. Storing the stylus inside the housing provides more security to the stylus, but suffers from the disadvantage that the user must take additional steps in order to release the stylus from its place of storage. For example, in one case, a user may be required to reach into the housing to grasp the stylus. In another example, a user may be required to push the pen further into the housing in order to activate a "door lock release" that will push the stylus out of the housing when the user pushes the pen further into the housing.

Accordingly, there remains a need for a simple and convenient mechanism and method for providing a stylus to a user in a manner that avoids and overcomes the disadvantages set forth previously.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a stylus removal mechanism that does not require the user to manipulate, touch or otherwise grasp the stylus in order to remove the stylus from its storage location.

It is a further object of the present invention to provide a stylus removal mechanism that simultaneously removes the stylus from its storage location and releases the top cover of a portable computing device.

In order to accomplish the objects of the present invention, a portable computing device is provided having a first housing, and a second housing hingedly coupled to the first housing. The second housing having an interior that stores a stylus, and which houses a stylus removal mechanism in a manner such that manipulation of the stylus removal mechanism simultaneously releases the first housing from the second housing and removes the stylus from the second housing.

In one embodiment of the present invention, the stylus removal mechanism has a block which has a chamber for receiving a portion of a stylus, a first biasing element coupled to the block to bias the block in a first direction, a latch assembly that includes a plate having a hooked leg, and a second biasing element coupled to the plate to bias the plate in a second direction different from the first direction. The hooked leg engages the block against the bias of the first biasing element. When the plate is moved in a third direction opposite to the second direction, the hooked leg disengages the block so that the second biasing element biases the block in the first direction.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a perspective view of a palm-top computer in which the stylus removal mechanism of the present invention can be implemented.

FIG. **2** illustrates a cross-sectional side view illustrating one embodiment of the stylus removal mechanism of the present invention.

FIG. **3** is a perspective view of the stylus removal mechanism of FIG. **2** disposed in an open display housing.

FIG. **4** is an exploded perspective view illustrating in greater detail the switch assembly of FIG. **3**.

FIG. **5** is a bottom view of the stylus removal mechanism of FIG. **3** showing a stylus stored in the stylus housing.

FIG. **6** is a perspective view of the stylus removal mechanism according to another embodiment of the present invention disposed in an open display housing.

FIG. **7** is an exploded perspective view illustrating in greater detail the switch assembly of FIG. **6**.

DETAILED DESCRIPTION OF THE INVENTION

In the following description, for purposes of explanation and not limitation, specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be apparent to one skilled in the art that the present invention may be practiced in other embodiments that depart from these specific details. In certain instances, detailed descriptions of well-known or conventional mechanical parts and structures are omitted so as to not obscure the description of the present invention with unnecessary detail.

The present invention provides a stylus removal mechanism that is capable of (1) removing a stylus from a stylus housing without a user having to grasp, touch or otherwise manipulate the stylus, and (2) simultaneously removing a stylus from a stylus housing and releasing a display housing from a keyboard housing. For purposes of the descriptions set forth herein, the term "portable computing device" is intended to mean any electronic device that utilizes a pen or stylus as an input or indicating device. Non-limiting examples can include palm-top computers, hand-held computers, laptop computers, PDAs, electronic calculators, electronic planners, among others, and do not need to include separate keyboard and display housings that are hinged or pivoted together.

FIG. **1** illustrates a perspective view of a portable computing device **10** in which the stylus removal mechanism **70** of the present invention can be implemented. The portable computing device **10** in FIG. **1** is illustrated in the form of a palm-top computer, although the principles of the present invention are also applicable to other portable computing devices. Palm-top computer **10** includes a display housing **30** for housing the display **31** (see FIG. **2**), a stylus **60**, and display electronics (not shown). The palm-top **10** also includes a keyboard housing **40** for housing the keyboard and the computer electronics (not shown). The display housing **30** is hingedly coupled to the keyboard housing **40** by a hinge **16**. FIG. **1** illustrates the palm-top **10** in a closed or storage position. When the display housing **30** is opened to reveal the display, the palm-top **10** is in an open or release position. A user-manipulable switch or knob **80** is provided